REMARKS/ARGUMENTS

This case has been carefully reviewed and analyzed in view of the Office Action dated 15 October 2009. Responsive to the rejections made in the Office Action, Claims 1-6, 8-12, 14, 16, 17, 19-22, and 25 have been amended and Claims 7, 13, 23, 24 and 26-56 have been cancelled by this amendment. Thus, upon entry of this Amendment, Claims 1-6, 8-12, 14-22 and 25 will be pending.

A drafting error in Fig. 5 has been corrected by this Amendment, correcting the label of block 504. No new matter has been added by the amendment to the drawing.

In the Office Action, the Examiner rejected Claims 1, 3-12, 14-16, 19, 21-28, 30-40 and 42-56 under 35 U.S.C. § 103(a) as being unpatentable over Fortin et al., U.S. Patent Application Publication 2005/0278522 (hereinafter "Fortin"), in view of Ehrlich et al., U.S. Patent Application Publication 2005/0141375 (hereinafter "Ehrlich"). Claims 2, 20 and 41 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Fortin in view of Ehrlich and further in view of Xue et al., U.S. Patent Application Publication 2007/0104269 (hereinafter "Xue"). Additionally, Claim 13 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Fortin in view of Ehrlich and further in view of Yamamoto et al., U.S. Patent No. 6,532,513 (hereinafter "Yamamoto"), and Claim 18 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Fortin in view of Ehrlich and further in view of Gentry et al., U.S. Patent No. 5,875,352 (hereinafter

"Gentry"). Further, Claim 17 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Fortin in view of Ehrlich and further in view of Rao, U.S. Patent Application Publication 2002/0054309, and Claim 29 as being unpatentable over Fortin in view of Ehrlich and further in view of Thompson et al., U.S. Patent No. 5,463,772 (hereinafter "Thompson").

Before discussing the prior art relied upon by the Examiner, it is believed to be beneficial to first briefly review the structure and method of the present invention as now claimed. The present invention, as now defined in Claim 1, is directed to a multimedia playback apparatus. The multimedia playback apparatus includes a mass storage device having a multiplicity of blocks of multimedia data stored thereon. The multimedia data includes video and audio data. The apparatus also includes a cache buffer coupled to the mass storage device for storing a plurality of blocks of the multimedia data read from the mass storage device. The cache buffer has a capacity for storing a first amount of the multimedia data. The apparatus further includes a track buffer coupled to the cache buffer and has a storage capacity for storing a second amount of the multimedia data read from the cache buffer. Further, the multimedia playback apparatus includes a cache manager coupled to the cache buffer and the track buffer for controlling transfer of the multimedia data from the mass storage device to the cache buffer and from the cache buffer to the track buffer. The cache manager, responding to a read request of a particular block of multimedia data,

fetches the requested block of multimedia data from the mass storage device and fetches additional blocks of multimedia data anticipated as being subject to future read requests to substantially fill the cache buffer for transfer to the track buffer and the mass storage device enters a reduced power consumption mode responsive to the cache buffer being filled with a plurality of untransferred blocks of multimedia data to a first threshold level. The mass storage device exits the reduced power consumption mode responsive to the plurality of untransferred blocks of multimedia data being below a second threshold level. The cache manager replaces blocks of transferred multimedia data in accordance with a priority hierarchy based on at least one characteristic of the blocks of multimedia data.

From another aspect, as defined in Claim 14, the present invention is directed to a method of controlling a multimedia storage device. The method includes the step of providing a rotating media storage drive with a multiplicity of blocks of multimedia data stored thereon. The method further includes the step of storing the plurality of blocks of multimedia data read from the rotating media storage drive into a cache memory responsive to a read request for one of the plurality of blocks of multimedia data. Further, the method includes the steps of receiving a scan command, and if the multimedia data corresponds to the scan command is stored in the multimedia cache, transferring the corresponding

multimedia data from the cache memory to a track buffer for subsequent rendering.

From yet another aspect, as defined in Claim 19, the present invention is directed to a method of processing multimedia data. The method includes the steps of determining that multimedia data is to be read from a rotating media storage device, and transferring a quantity of multimedia data from the rotating media storage device to a cache memory responsive to a read request for a first portion of the quantity of multimedia data. A remaining portion of the quantity of multimedia data is multimedia data anticipated as being subject to future read requests. Responsive to the first quantity of the multimedia data being stored in said cache memory, the method includes the step of ceasing further transfer of the multimedia data from the rotating media storage device into the cache memory and causing the rotating media storage device to spin down and thereby enter into a power saving mode. Further, the method includes sequentially writing portions of the quantity of multimedia data from the cache memory to a track buffer for subsequent rendering. Still further, at least partly in response to a portion of the quantity of multimedia data yet to be written to the track buffer being stored in the cache memory falling below a threshold value, the method includes causing the rotating media storage device to spin up and thereby exit the power saving mode.

It is respectfully submitted that the Fortin reference is directed to an apparatus and method to decrease boot time and hibernation awakening time of a

computer system. Contrary to the Examiner's interpretation, the reference discloses a memory 312, identified as a "cache memory" that functions similarly to applicant's track buffer. The memory 312 is "used to buffer data being read from or written to the storage medium," paragraph 32. The persistent storage device 300, in addition to including the memory 312, includes a flash memory 200 that, during limited times carries out some of the functions of applicant's cache buffer.

In operation, the referenced system stores the static and dynamic configuration data in the flash memory 200 when the system is being powered down or going into hibernation, for subsequent use when the system is rebooted or awakened from hibernation, paragraphs 34-38. The flash memory 200 is interfaced with the computer system to appear as a sector of the rotating media, disk 304 (paragraph 32), and thereby functions as a cache for the static and dynamic configuration data to thereby read that data without having the delay of the rotating media's spin up and seek time. The use to the disclosed flash memory cache for read operations is **only** disclosed for improving reading speed during booting of the computer or exiting from hibernation. During normal operation, the reference only discloses use on the flash memory to cache (accumulate) data to be stored on the rotating media and thereby reduce the number of times the drive has to be spun up. Thus, when the available free space falls below a threshold, the data that had been stored in the flash memory is written to the rotating media.

Any interconnection between the memory 312 and the flash memory 200 is not disclosed by the reference. Nowhere does Fortin disclose storing an data read from the rotating media into the flash memory cache, let alone any data anticipated as being the subject of future read requests. Nor does the reference disclose entering a reduced power mode responsive to the flash memory cache being filed to a threshold level or transferring data directly to the track buffer (bypassing the cache) when the requested data does not exceed the priority hierarchy for overwriting/clearing data in the cache. In fact, nowhere does the reference disclose any scheme of preserving data in the cache during subsequent read requests. Since data is not maintained in a cache for response to subsequent read requests, the reference is silent as to using a cache to perform scan operations without repeating a read operation from the rotating media.

Thus, Fortin fails to disclose, suggest or present any reason for providing a cache manager coupled to the cache buffer and the track buffer for controlling transfer of the multimedia data from the mass storage device to the cache buffer and from the cache buffer to the track buffer, the cache manager responding to a read request of a particular block of multimedia data fetches the requested block of multimedia data from the mass storage device and fetches additional blocks of multimedia data anticipated being subject to future read requests to substantially fill the cache buffer for transfer to the track buffer and the mass storage device enters a reduced power consumption mode responsive to the cache buffer being

filled with a plurality of untransferred blocks of multimedia data to a first threshold level, the mass storage device exiting the reduced power consumption mode responsive to the plurality of untransferred blocks of multimedia data being below a second threshold level, the cache manager replacing blocks of transferred multimedia data in accordance with a priority hierarchy based on at least one characteristic of said blocks of multimedia data, as now defined in Claim 1. Nor does the reference disclose, suggest or present any reason for providing the cache manager causes the mass storage device to transfer a requested block of multimedia data from the mass storage device to the track buffer responsive to the priority hierarchy failing to be exceeded, as now claimed in Claim 5. Fortin fails to disclose, suggest or present any reason for providing a method where if the multimedia data corresponding to the scan command is stored in the multimedia cache, transferring the corresponding multimedia data from the cache memory to a track buffer for subsequent rendering, as now claimed in Claim 14. Further, the reference fails to disclose, suggest or present any reason for providing transferring a quantity of multimedia data from the rotating media storage device to a cache memory responsive to a read request for a first portion of the quantity of multimedia data, a remaining portion of the quantity of multimedia data being multimedia data anticipated being subject to future read requests, and a method step where at least partly in response to a portion of the quantity of multimedia data yet to be written to the track buffer stored in the cache memory falling below

a threshold value, causing the rotating media storage device to spin up and thereby exit the power saving mode, as now defined in Claim 19.

The Ehrlich reference does not overcome the deficiencies of Fortin. The Ehrlich reference is directed to a rotatable media storage device that uses multiple disk spin-speeds as a means of speeding access times for reading/writing to the disk. This reference discloses a system that permits reading or writing to a rotating media prior to that media spinning up to its nominal rotational speed, as a function of the quantity of data to be read or written. Where the quantity of data is small, time can be saved by accessing the disk at lower than the nominal operating speed. Contrary to the Examiner's interpretation of paragraphs 9 and 21, any other portion of the reference, there is no disclosure or suggestion of entering or exiting the power saving mode (disk idle) based on the amount of data stored in a cache memory. To the contrary, paragraph 9 suggests that the power saving mode is entered responsive to the expiration of a time period of drive inactivity (devoid of read or write requests), "...when there have been no **recent** read or write requests, causing the disk drive to go into a power saving mode where the disk stops spinning," emphasis added. Such also implies that exiting the power saving mode (spin up) is responsive to receipt of a read or write request. The graph of Fig. 11, referred to in paragraph 21, simply illustrates the advantage of reading and writing small quantities of data at less than the nominal spin speed, and that it is

not detrimental to do the same when there is a large amount of data to be read or written, paragraphs 65-66.

Hence, the combination of Fortin and Ehrlich fail to disclose, suggest or present any reason for providing a cache manager coupled to the cache buffer and the track buffer for controlling transfer of the multimedia data from the mass storage device to the cache buffer and from the cache buffer to the track buffer, the cache manager responding to a read request of a particular block of multimedia data fetches the requested block of multimedia data from the mass storage device and fetches additional blocks of multimedia data anticipated being subject to future read requests to substantially fill the cache buffer for transfer to the track buffer and the mass storage device enters a reduced power consumption mode responsive to the cache buffer being filled with a plurality of untransferred blocks of multimedia data to a first threshold level, the mass storage device exiting the reduced power consumption mode responsive to the plurality of untransferred blocks of multimedia data being below a second threshold level, the cache manager replacing blocks of transferred multimedia data in accordance with a priority hierarchy based on at least one characteristic of said blocks of multimedia data, as now defined in Claim 1. Nor does the combination of references disclose, suggest or present any reason for providing the cache manager causes the mass storage device to transfer a requested block of multimedia data from the mass storage device to the track buffer responsive to the priority hierarchy failing to be

exceeded, as now claimed in Claim 5. The combination of Fortin and Ehrlich fails to disclose, suggest or present any reason for providing a method where if the multimedia data corresponding to the scan command is stored in the multimedia cache, transferring the corresponding multimedia data from the cache memory to a track buffer for subsequent rendering, as now claimed in Claim 14. Further, the combination of references fails to disclose, suggest or present any reason for providing transferring a quantity of multimedia data from the rotating media storage device to a cache memory responsive to a read request for a first portion of the quantity of multimedia data, a remaining portion of the quantity of multimedia data being multimedia data anticipated being subject to future read requests, and a method step where at least partly in response to a portion of the quantity of multimedia data yet to be written to the track buffer stored in the cache memory falling below a threshold value, causing the rotating media storage device to spin up and thereby exit the power saving mode, as now defined in Claim 19.

As the combination of Fortin and Ehrlich fails to disclose, suggest or present any reason for providing the concatenation of elements that form the present invention, as now claimed, they cannot make obvious that invention.

It is now believed that the subject Patent Application has been placed in condition for allowance, and such action is respectfully requested.

No fees are believed to be due with this Amendment. If there are any further charges associated with this filing, the Director of Patents and Trademarks is hereby authorized to charge Deposit Account #18-2011 for such charges.

Respectfully submitted,
For: ROSENBERG, KLEIN & LEE

/David I. Klein/

David I. Klein
Registration #33,253

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3458 Ellicott Center Drive, Suite 101
Ellicott City, MD 21043
(410) 465-6678
Customer No. 04586

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/David I. Klein/
DAVID I. KLEIN